

CLAIMS

1. A rotary connector comprising
a first part;
a second part configured to rotate relative to said first part;
an electrical cable housed within the rotary connector; and
a viewing window configured to reveal a feature of said electrical cable
when the rotary connector is in a neutral position.
2. The rotary connector of Claim 1, wherein said first part is a stationary case and said second part is a rotary case.
3. The rotary connector of Claim 2, wherein said viewing window comprises:
a first through hole positioned at a predetermined position on said rotating case; and
a second through hole positioned at a predetermined position in said stationary case such that the first and second through holes overlap to reveal an interior annular space of the connector that said electrical cable is housed within when the rotating case is rotated with respect to the stationary case, wherein said feature of the electrical cable comprises a u-shaped bend that occupies the overlapping area of the first and second through holes when said rotary connector is in said neutral position.
4. The rotary connector of Claim 3, wherein said rotating case and said stationary case have substantially the same axis of rotation and said first and second through holes have substantially the same radial position with respect to the axis.

5. The rotary connector of Claim 2, further comprising an electrical junction configured to provide electrical connection between the electrical cable and an external unit.

6. The rotary connector of Claim 5, wherein said electrical junction comprises pins.

7. The rotary connector of Claim 5, wherein said electrical junction comprises wires.

8. The rotary connector of Claim 5, wherein said electrical junction comprises a rotating junction coupled to said rotating case.

9. The rotary connector of Claim 5, wherein said electrical junction comprises a stationary junction coupled to said stationary case.

10. The rotary connector of Claim 2, wherein said stationary case comprises mounting tabs configured to mount said rotary connector to an assembly.

11. The rotary connector of Claim 2, wherein said electrical cable comprises an electrical conductor embedded in an insulating material.

12. The rotary connector of Claim 2, wherein said electrical cable comprises an optical signal transmission line.

13. The rotary connector of Claim 2, wherein said electrical cable comprises a plurality of flexible flat cables.

14. The rotary connector of Claim 2, wherein said stationary case comprises:

a lower flange and a stationary upper flange opposing said lower flange;
and

an outer cylinder wall connecting said lower and stationary upper flanges, said stationary upper flange having a stationary through hole positioned at a predetermined radial and angular positions.

15. The rotary connector of Claim 14, wherein said rotating case comprises;

an inner cylinder shaft portion; and

a rotating upper flange overlapping the stationary upper flange of said stationary case when said rotating case is rotationally coupled to said stationary case, said rotating upper flange having a rotating through hole that overlaps said stationary through hole when the rotating case is positioned at a predetermined position relative to said stationary case.

16. The rotary connector of Claim 15, wherein said inner cylinder shaft portion opposes said outer cylinder wall, and said upper stationary flange opposes said lower flange to form an annular space within said connector when said rotating case is rotationally coupled to said stationary case.

17. The rotary connector of Claim 16, wherein said electrical cable comprises a flexible flat cable having a first portion of its length wrapped around the inner cylinder shaft portion of the rotating case in a first direction, the flat cable then being turned back upon itself to form a U-shape so that a second portion flexible flat cable length is wound inside the outer cylinder wall of the stationary case in an opposite direction to the first direction.

18. The rotary connector of Claim 17, wherein said first and second portions of said flexible flat cable have predetermined lengths that ensure that the U-shape bend of the flexible flat cable is visible within an overlapping area of the windows when the rotary connector is in said neutral position.

19. The rotary connector of Claim 1, wherein said viewing window is configured to reveal a feature of said electrical cable only when the rotary connector is in a neutral position.

20. The rotary connector of Claim 1, wherein said rotary connector does not include an indication arrow for indicating said neutral position.

21. A steering wheel assembly comprising a rotary connector as claimed in any one of Claims 1-20.

22. A method of manufacturing a rotary connector, comprising:
providing first and second parts of the rotary connector that can be rotationally coupled to one another;
providing a flexible cable that can be housed within the rotary connector when the first and second parts are rotationally coupled to one another; and
arranging the flexible cable in a predetermined arrangement within the rotationally coupled first and second parts such that a feature of the flexible cable is visible from an exterior of the rotary connector when the first part is in a neutral position relative to the second part.

23. The method of Claim 22, wherein said arranging the flexible cable comprises arranging the flexible cable to form a U-shaped bend as said feature.

24. A rotary connector comprising
a stationary case;
a rotating case configured to rotate relative to the stationary case;
an electrical cable housed within the rotary connector; and
means for indicating a neutral position of the rotary connector.

25. A method of identifying a neutral position of a rotary connector, comprising:

rotating a first part of the connector relative to a second part of the connector such that through holes in the first and second part are substantially aligned to reveal an interior annular space of the rotary connector; and

positioning the first and second parts of the connector such that a feature of an electrical cable housed in the interior annular space is visible to indicate a neutral position of said rotary connector.